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Factors Influencing Intellectual Capital Measurement Practices

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Abstract

This study aims to identify variety of factors influencing enterprise IC measurement practice, structure them into the groups according their nature, and propose theoretical model serving as a base for the empirical research of their influence. Literature review of theoretical studies and empirical research is carried out in order to find out the range of influencing factors. Theoretical model proposed covers two basic constructs: (1) a set of influencing factors; and (2) basic features of IC measurement practice. The model intends to draw attention to the variety of factors influencing enterprise IC measurement practice, bring more light to the interrelationships between those factors and IC measurement features, and contribute to the development of IC measurement methodology as a whole by drawing some guidelines for systematic empirical research and highlighting specific areas of concern for further theoretical research.

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Keywords: Intellectual capital; Measurement; Measurement practice; Influencing factors; Model.

Introduction

Successful management of knowledge and intellectual capital (further IC) is recognized as the key task for managers in knowledge economy. Academics as well as business practitioners in many countries put an essential emphasis on successful management of this resource. As managers' awareness of the critical role of IC increases, there is an increasing demand for studies investigating IC management practices.

IC measurement is considered to be one of the most important components of IC management practice (Roos et al., 2005). It is vital for company's strategic management, continuous improvements and organizational development (Thorleifsdottir, A., Claessen, E., 2006). Based on the recent IC literature and experience of EU

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projects such as InCaS (2009) and CADIC (2012), IC measurement techniques act as the basis for successful IC management. Accordingly IC measurement methodology is one of the cornerstones in IC theory development.

IC measurement and management practices differ among countries, industries or companies (Thorleifsdottir, A., Claessen, E., 2006; InCaS, 2009; CADIC, 2012). A common view on IC measurement as well as generally accepted IC measurement principles still do not exist. Methodology is under development and many unanswered questions still exist. IC measurement practice adopted by companies varies and depends on different factors: perception of the concept and importance of IC, management experience, business model, industry sector, company's size and performance, culture and climate, and other factors. However, there seems to be an obvious gap in IC literature to assess the impact of those factors on IC measurement practices and to find out which of them are the most relevant from the methodology development point of view. Identification of such factors is important for several reasons:

- Development of IC measurement practice goes fairly chaotic; there is a lack of thorough understanding regarding the reasons why some aspects are developed more than the others, and what are the reasons for the emphasis on some factors;
- Awareness of such factors enables to judge on the relevance of particular IC measurement solutions and assess their prevalence in the future;
- Studies exploring influence of single factors on IC measurement practice are usually met in scientific literature, however, thorough investigation of the influence of a bundle of factors is absent;
- Research of the impact of such factors contributes to the development of IC measurement methodology and offers opportunity to develop specialized solutions for particular organizations or contextual situations where they are the most relevant.

Therefore, this study aims to investigate the variety of factors influencing IC measurement practices, combine them into groups according to their nature and propose theoretical model which could serve as the base for empirical research on the influence of those factors. The model is intended to visualize a set of influencing factors and their impact on particular features of IC measurement practice, define conceptual links between them and open up key areas of their in-depth exploration for discussion.

1. Literature review

Studies related to the factors influencing IC measurement and management practices can be found in IC theory as well as knowledge management, project management or finance literature. In most cases, researchers concentrate on a single factor (Kruger (Neels) & Johnson, 2010) or a couple of closely related factors that have potential influence on the research object (Nazari, et al., 2011). In some studies the direct influence on IC management practice is examined (Kianto, et al., 2010; Nazari, et al., 2011; Ferreira, et al., 2012, Ferreira, 2014), while the others focus on a broader field of research covering issues of IC measurement and management or having some other interfaces (Hussain & Hoque, 2002; Tayles, et al., 2007; Kruger (Neels) & Johnson, 2010; Lin, 2013). Literature review performed in this study in order to find out the whole range of factors potentially affecting IC measurement practices is summarised in Table 1.

Studies by Kianto, et al. (2010) and Nazari, et al. (2011) can be considered to be a classical example of such research within IC literature. Kianto, et al. (2010) examine the influence of the type of organization on IC by itself and its management. They argue that significant differences exist in the stock, creation, management and protection mechanisms of IC between service-oriented and product-oriented companies. Nazari, et al. (2011) investigate the role of organizational culture and climate in supporting IC management systems. They argue that both culture and climate play significant roles in developing management systems of IC.

Hussain & Hoque (2002) investigate factors affecting the design and use of non-financial performance measurement systems in the banking sector. Based on their study economic constraints appear to be the most forceful factor, followed by the central bank's regulatory control, accounting standards, management's strategic focus, bank size, competition and organizational tendency to copy best practices from others.

Table 1. Overview of research on influencing factors

Author	Year	Research focus	Type of research	Research sample	Factors investigated
Hussain, Md. M., Hoque, Z.	2002	Factors affecting the design and use of non-financial performance measurement systems in Japanese banks	Multi-site case studies based on the interviews and other data sources	4 Japanese banks	Economic constraints; Competition; Copying best practice from others; Central bank's regulatory control; Accounting standards/ financial legislation; Socioeconomic-political institutions' pressures; Professionals; Top management / corporate culture; Organizational strategic orientation; and Organizational characteristics.
Tayles M., Pike R. H., Sofian S.	2007	Managers perception of the influence of the level and shape of IC on management accounting practices	Survey	119 large Malaysian companies	The level and shape of IC including wide range of factors covering IC importance, IC reporting, human, structural and relational intellectual capital.
Kianto, A., Hurmelinna-Laukkanen, P., Ritala, P.	2010	Differences in IC stocks, creation, management and protection mechanisms between service-oriented and product-oriented companies.	Survey	418 respondents from 335 Finnish companies	Organization type: service-oriented versus product-oriented companies.
Kruger (Neels), C. J., Johnson, R. D.	2010	Knowledge management maturity according to organizational size	Survey	434 respondents from 86 South African organizations	Organizational size
Nazari, J. A., Herremans, I.M., Isaac, R. G., Manassian, A., Kline, T. J. B.	2011	Relationship between organizational characteristics (culture and climate) and IC management systems in the Middle East and Canada	Survey	205 respondents from Canada and the Middle East (Iran and Lebanon)	Organizational culture and climate
Molodchik, M., Shakina, E., Bykova, A.	2012	IC transformation into companies' value and the key factors of this process	Regression analysis	332 companies from different European countries	Company's size; Industry; Country; Capital location; KEI sub-indexes (economic intensive regime, innovation, education, ICT).
Ferreira A. L., Branco, M. C., Moreira, J. A.	2012	Factors influencing IC disclosure by Portuguese companies	Regression analysis	45 Portuguese companies	Company size; Ownership concentration; Leverage levels; Profitability; Industry affiliation; Type of auditor; Level of IC.
Lin, H-F.	2013	Factors influencing knowledge management system adoption and continuance intention	Survey, partial least squares analysis	220 respondents from Taiwanese firms	Organizational readiness; Expected benefits; Organizational learning capability.
Ferreira, A.I.	2014	Interrelationship between the perceptions of organizational culture and the perception of IC measures	Survey	401 respondent from Portuguese technological, health and services sectors	Types of organizational culture including clan, hierarchy and market cultures.

Scientific evidence of the impact of factors influencing IC measurement practices can also be observed from the broader studies focused on the larger-scale or partly related practices of organizations. For example, based on the study by Kruger (Neels) & Johnson (2010) on knowledge management maturity assessment according to organizational size, it can be assumed that organizational size would have a significant influence on IC management practices as well. As far as IC management is closely related to knowledge management and has common or interrelated activities, there are reasonable grounds to explore whether organizational size has similar impact on certain IC management activities.

The opposite-direction research investigating influence of IC measurement and management practices on organizational performance as well as factors determining this influence are common in IC literature as well. A significant contribution in this field belongs to Nick Bontis who has started IC research in early nineties. Based on his research (Bontis et al., 2000; Bontis & Fitz-enz, 2002; Cabrita & Bontis, 2008; Bontis & Serenko, 2009), there are lots of studies on the relationship between IC management and organizational performance carried out in different industries including biotechnology, banking, manufacturing, and especially service industries. In his recent empirical study carried out in the banking sector (Mention & Bontis, 2013), differences of the impact of particular IC elements and their combinations on business performance are highlighted. Factors making influence on IC transformation into company's performance are under investigation within similar studies as well. For example, Molodchik, et al. (2012) investigate different internal and external factors influencing IC transformation into company's value added as a return on investments in IC. Based on their research, supportive and obstructive internal and external factors exist, such us company's size, industry, country and location. Studies mentioned above reflects the complexity of the development of IC measurement and management methodology and a double-sided character of research required.

Based on the analysis of the studies, a wide variety of influencing factors exists. Factors vary from general corporate characteristics (such as the size of the company or sector it belongs to) or corporate management performance (such as culture and climate) to specific dimensions related to IC (such as perception of the importance of IC among managers). The contexts and objectives of research, based on which the analysis of influencing factors is carried out, vary considerably, while complex research summarising this variety is absent.

2. Theoretical model proposed

IC measurement practice is poorly studied so far (Roos, et al., 2005; Užienė, 2010). From the point of view of IC theory development the most significant contribution to this field belongs to Bontis (2001) and Andriessen (2004) who have made in-depth comparative analysis of more than twenty IC measurement methods. Luthy (1998) and Williams (2000) classified IC measurement methods into four groups as follows: (1) direct IC methods (DICM); (2) market capitalization methods (MCM); (3) return on assets methods (ROA); and (4) scorecards methods (SC). Based on the comparative analysis of thirty IC measurement methods, Vaškelienė (Užienė) (2006) found the dichotomy of IC measurement methods leading to their classification into two groups: (1) methods for the internal IC management; and (2) methods for the external IC disclosure.

Empirical data on IC measurement in practice is mainly collected through the projects funded by the European Commission. Based on the amount of empirical research in this field, it can be argued that little research has been done so far. This is caused by the fact, that IC measurement methodology is still under development which goes pretty slow and chaotic, while its advanced application in practice is quite rare.

Based on the previous research (Vaškelienė (Užienė), 2006; Užienė, 2010), IC measurement methods are usually intended to accomplish one of the missions: (1) measurement for internal management and decision making; and (2) measurement for external information disclosure as a supplement to financial statements. In the first case, managers act as receivers of information, while IC measurement methods perform the role of corporate performance measurement. In the second case, information received is intended for external stakeholders, while IC measurement methods perform the role of public disclosure and corporate image building. Based on the idea of such dichotomy and comparative analysis of a wide range of methods carried out by Bontis (2001), Andriessen (2004) and Vaškelienė (Užienė) (2006) as well as experience of InCaS project (InCaS, 2009), four basic questions related to IC measurement practice can be raised both in the analysis of IC measurement methods as well as in the studies of their practical application, as follows: (1) why to measure (what is the aim of measurement)?, (2) what to measure (what

information is required from the point of view of IC coverage and content)?, (3) how to measure (in what way information is collected, processed and presented)?, and (4) who is measuring (who is responsible for IC measurement, monitoring and management)? The format of four basic questions along with the answers to them helps to identify wide range of IC measurement techniques and take into account wide variety of contextual details of their application.

Based on the literature review carried out (see Table 1) and the questions reflecting the key aspects relevant to IC measurement practices identified, the conceptual model highlighting the variety of relationships between influencing factors and IC measurement practices as well as opening areas of potential research is suggested (see Figure 1).

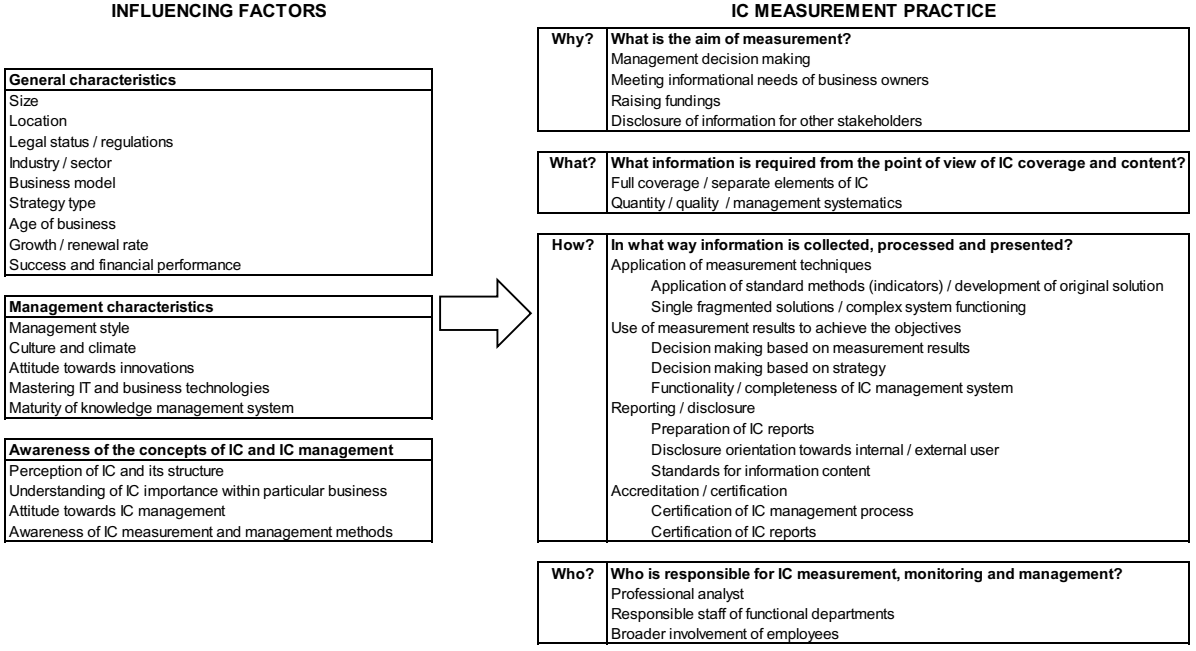

Fig. 1. Structure of the model

Influencing factors within the model are classified into three basic groups according to their nature: (1) general characteristics; (2) management characteristics, and (3) awareness of the concepts of IC and IC management. The first group of factors covering wide range of general corporate characteristics, such as corporate size, location, industry and similar are invoked within the empirical research most often. Factors related to corporate management, such as culture and climate or attitude towards innovations, are relevant and can be considered as accelerating and enabling better conditions for implementation of new measurement and management techniques and solutions. While the knowledge and awareness of the concepts of IC and IC management among managers are important for understanding of the relevance and meaning of IC measurement in particular contexts.

The format of four questions selected within the model enables monitoring and assessing wide variety of features specific to IC measurement practices, such as coverage and content of IC measurement, measurement techniques applied, objectives perceived among managers and similar.

Different combinations of relationships between influencing factors and IC measurement practices make sense based on the model proposed. For example, the hypotheses that corporate legal status can have influence on the practice of IC reporting, or industry and sector (based on the differences of importance of particular IC elements within different sectors) can possibly have impact on the content of IC measurement and indicators selected can be raised and verified. Similarly, corporate climate or maturity of knowledge management system can have influence

on the functionality and effectiveness of IC management system developed in organization. While the perception of IC structure among managers will certainly have impact on the content of measured IC.

Despite the fact that the model is more focused on the horizontal relationships, existence of the vertical interdependencies between different influencing factors or among the features of IC measurement practices should not be dismissed. For example, age of the business can potentially be related with maturity of the knowledge management system. Or the objectives of measurement certainly makes influence on selection of measurement techniques. This confirms the complexity and multi-directionality of potential research of the phenomenon investigated. However, this study is intended to open up variety of factors influencing IC measurement practices and define conceptual link between those factors and IC measurement practices by visualizing these interrelationships. For this reason horizontal interdependencies are emphasized within the model as the primary.

Groups of influencing factors identified within the model are not definitive or invariable. It is expected that they will be expanded and updated based on the further research. Dimensions of IC measurement practices have potential to be expanded as well. General visualization of relationships presented in the model reflects perception of the authors based on their previous research and is open for academic debate.

Conclusions

IC measurement methodology is still under development and there are few studies regarding the factors influencing its progress in practice. The greater step forward in this field is usually observed after the completion of the large-scale European projects, such as MERITUM or InCaS. However, the general research on IC measurement practices is still scarce and fragmented.

Knowledge on the factors influencing IC measurement practices provides new insights in the development of IC measurement methodology, enables its more accurate prediction and contributes to the development of the guidelines for more specific (eg. industry, company's size or business model oriented) IC measurement and management solutions.

The model suggested within this contribution is intended to bring more light on the issue by conceptualizing the link between factors influencing IC measurement practices and the practices by itself. It is expected that this contribution will draw attention to the factors influencing the development and implementation of IC measurement methodology, provide the picture of their variety and complexity and open up new areas for discussion and further research.

After in-depth discussion of the model, its empirical verification would be required. In the initial stage of research the case studies carried out within companies advanced in IC management would serve as a suitable research approach. While in the following stages of development of IC measurement practices or going deeper into the smaller-scale research on particular factor or a couple of them the surveys could be employed next to the case studies.

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